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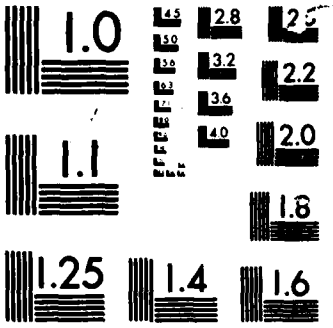
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A brief account of the training of the U.S. 5th Division in gas warfare and its actual participation at Frapelle, at St. Mihel, and in the Meuse-Argonne, particularly in the attacks on the heights of Cunel and the assault crossing of the Meuse River. The author concludes that when the United States entered World War I, it found gas warfare part of the standard operating procedure of all the armies of the Western Front. Voluntary abnegation proved futile. On the battlefield, the need to maintain the morale of the assault infantry and the utility of gas in screening attacks, protecting flanks, and neutralizing enemy strongpoints provided much more convincing rationales for the use of gas than any concept of deterrance.

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THE U.S. 5TH DIVISION AND GAS WARFARE, 1918

During World War I, gas warfare began in the summer and fall of 1914 when the French Army made a few sporadic attempts to use in the open field 26-mm rifle grenades filled with tear gas. The efforts failed, but they provided the Germans with justification for far more lethal experiments. Attempts to use artillery shells filled with tear gas against the Russians at Bolimov in January 1915 and against the British at Nieuport in March 1915 produced no appreciable results, but at Ypres the Germans succeeded in virtually destroying the French 45th Algerian Division. Twenty thousand men were gassed; 5,000 died by strangulation. From then until the end of World War I the belligerents vied with one another to produce toxic or incapacitating chemicals while at the same time developing protective devices to shield their own troops against the effects of the enemy's gases. In this competition the Germans held a decided advantage because they had monopolized the prewar chemical and dye industries. Not until 1918 did the British and French master the intricacies of gas warfare. The United States never did.

On 17 November 1917, the War Department ordered the creation of the 5th Division using Regular Army units from Kansas, North Carolina, Georgia, and Texas. Maj. Gen. John E. McMahon commanded the division during most of its training. McMahon, a veteran artilleryman, insisted on sound gas instruction. Gas masks were among the few pieces of standard equipment actually in the hands of the troops. The division had no machine guns or artillery. Tent pegs driven into the ground indicated where the wheels of field pieces would rest so that artillery recruits might have gun drill. Infantrymen practiced with concrete grenades.

Advance elements of the division sailed for England in late February 1918. The bulk of the division embarked in April, and at the end of the month concentrated at the Bar-sur-Aube training area in France, about one hundred kilometers from the front. A combination of French instructors with recent frontline experience and plentiful material gave the division much

more realistic training in gas warfare than it had previously obtained. Following standard training procedure in World War I, the division entered a quiet sector of the line on 1 June 1918. The men trained as detachments with French units in rear areas, then in the trenches as regiments and brigades attached to French divisions. Finally, 5th Division Headquarters took control of the troops and became responsible for the defense of a sector. During the initial phases of the training, the Americans used live grenades for the first time. Gas training concentrated on the hazards of and protection against mustard gas.

Mustard gas is a powerful liquid vesicant that attacks all parts of the body. It destroys the lungs, blinds the eyes (usually permanently), and produces blisters on the body. Clothing, boots, even rubber, provide no protection against it in liquid form. Even in very dilute vapor it is exceedingly dangerous and will incapacitate if it does not kill. It is also persistent. An area drenched in mustard gas will remain dangerous long afterwards. Raw concrete not subject to weathering will retain lethal concentrations of the gas over twenty-five years after the initial exposure. It also has little or no odor, something like mild horseradish according to survivors. This property makes it particularly dangerous. Troops undergoing heavy physical exertion are all to prone to rip off gas masks with the least excuse. This tendency was all the more pronounced in green American divisions like the 5th.

On the night of 15-16 June 1918, three of the division's infantry regiments entered the line in the Anould Sector in the Vosges as attachments to the French 21st Division. About 0200 on 17 June, the 39th Bavarian Reserve Division staged a trench raid on elements of the U.S. 60th Infantry and the French 64th Infantry. The Germans drenched the Allied position with phosgene, an asphyxiating gas. Twenty-three Americans and forty-five Frenchmen became gas casualties. Two of the Americans died.

After a month in the sector, during which little more occurred, the division reunited under General McMahon's control and relieved the French 62d Division in front of the town of St. Die, the sector north of Anould. Aggressive American patrolling provoked a German reaction on the night of 14 August. The Germans

shelled American battery positions and the lines of the 6th Infantry at Chapelle St. Clair. Forty rounds of 105-mm mustard gas caused twenty-two casualties among the American infantrymen. General McMahon had by this date formed some tentative conclusions about gas warfare. "There is nothing more discouraging to our troops", he said, "than to be subjected to a projector attack without any means of reply in kind." He thought that American divisions should be prepared to fire four times the amount of gas shells they received. More than morale concerned him. Gas, he thought, provided the best means of neutralizing hostile artillery batteries. He was about to test his theories at Frapelle.

Frapelle was a small village in a salient in the German lines pointing toward St. Die. The mood of many American officers arriving in France with a burning desire to prove the high quality of the U.S. Army to skeptical allies apparently infused 5th Division Headquarters and led to plans for an attack to forestall the German "threat" to St. Die. In fact, the Germans had only third-rate divisions manned by over-aged reservists in the area, and the "garrison" of Frapelle consisted of only a four-man outpost.

Backed by thirty-four batteries of field artillery, two companies of the 6th Infantry jumped off at 0400 on 17 August after six minutes of intense artillery preparation using high explosive shells. As the infantry moved out, the artillery turned to neutralizing supporting German positions. In a ten-minute period, eight batteries of 75-mm guns fired 1,064 gas shells into the Bois Carré, suppressing German machine guns located there. A German counterbarrage caught the second, third, and fourth waves of American infantry as they advanced out of their trenches. The leading two companies, however, overran the village and Hill 451 that dominated it. They captured or killed all four Germans, but at a cost of 104 men killed or wounded, of whom fifteen were gas casualties.

The American and German artillery fell silent at 0430. The men of the 6th Infantry, soon reinforced by elements of the 11th Infantry, hurriedly organized the defense of their newly won positions in anticipation of the inevitable counterattack. Well they might, but when the attack came, it came from an unexpected quarter. At 1400, the German artillery opened fire on the village. The Americans soon learned what the Germans had long known: Frapelle, located at

the bottom of a deep valley and nestled beneath a sheer cliff facing the German lines, was a natural gas trap. German yellow cross shells -- the designation given mustard gas shells -- exploded against the face of the cliff and produced air bursts of mustard gas that rained on the village. The gassing continued through the 17th and the 18th. At 2100 on 18 August, just as the Americans began to evacuate gas casualties from Frapelle, the Germans made a ground assault. One of the few surviving field messages vividly conveys the situation:

> Enemy artillery too active. Infantry badly handicapped, losing heavily. Infantry demand and need support of our artillery. Just received report that enemy coming in force.

A battalion of the U.S. 21st Field Artillery immediately laid down a gas barrage 600 yards in front of the American positions. The shelling and small arms fire broke the attack, but the German shelling continued. By evening, the Americans had suffered a total of 100 gas casualties.

Some 600 Americans held the town, no part of which was free from concentrations of gas. Not until 2030 on 18 August did decontamination begin, which could take place only at night since the entire area was under German observation. By morning of 19 August, another forty-five Americans had been gassed. To keep casualties at a minimum, the 5th Division thinned out the defenders by half, and all men in the area received French Tissot masks and gloves. The Tissot was the finest gas mask developed by any Army during the war, but it was extremely bulky. For that reason, while it was standard issue for the French artillery it was never given to the infantry. The gassing continued, and by the time the 92nd Division took over the sector beginning on 21 August, the 5th Division had suffered 300 gas casualties.

The division surgeon of the 5th Division spoke contemptuously of "gas fright" causing the case-load to soar, but the closest student of the operation, the historian Rexmond Cochrane, believes that gas mask exhaustion was the real culprit. Many early arrivals at Frapelle had worn their masks -- the less efficient British box masks, that were standard issue in the American infantry -- more or less continuously during thirty hours of almost constant exertion. But the attitude at division headquarters was that gas served principally as an excuse for malingering.

The division next moved to the Arches training area, received new equipment and replacements, and began training for mobile warfare. The schools created by the division included a gas warfare school. The respite was brief. On 29 August, the 5th Division began moving to Lorraine to join the U.S. I Corps, part of the new First Army, which was preparing to attack the St. Mihiel salient. On 10 September, the division relieved elements of the U.S. 90th Division on the right flank of the First Army. The 5th Division occupied the center of the corps position, with the 90th and 82d Divisions on its right and the 2d Division on its left.

The arrival of the 5th Division at the front followed a persistent argument at First Army Headquarters about the amount of artillery preparation needed for the attack. General John J. Pershing initially ordered no preparation. The troops were simply to attack behind a massive rolling barrage. Though members of the First Army staff found this decision unwise, no one would make a final decision on the artillery plan, which, including the gas plan, changed daily. Finally, two staff officers in the First Army G-3 section, Lt. Col. George C. Marshall, Jr., and Lt. Col. W.S. Grant, wrote a memorandum that forced a decision in which they objected to an absence of preparatory fire. Calling an attack without preparation "taking a gambler's chance," they observed that:

> Many areas such as woods, etc., should be drenched with gas before our troops are to pass through them, the gas bombardment on these places ceasing several hours before our troops arrive there. If there is no artillery preparation until H Hour we will be deprived of the use of gas on those locations where the necessity for gas is the greatest.

First Army finally decided on four hours of preparation, which meant that the artillery could use only nonpersistent gases. The divisions learned of the plan at approximately 1630 on 11 September, eight hours before the attack. Brig. Gen. A. L. Flager, commanding the 5th Division artillery, restricted use of gas shells to the attached heavy artillery groupments. These, which included 155-mm, 220-mm, and 8-inch units, would concentrate on woods and trench systems in the German rear. Apparently influenced by the division's recent unhappy experience at Frapelle, Flager restricted the heavies to nonpersistent tear gas. In contrast, the neighboring 90th Division doused the same types of objectives with nonpersistent toxic gases. Corps artillery fired mustard gas shells at long range during the preparatory barrage. The 5th Division Headquarters also directed the chemical

warfare platoon attached to the division to install six Stokes mortars to cover German machine gun nests and trenches with smoke, thermite, and skunk gas rounds. Though harmless, skunk gas was foul smelling and would force the German infantry to don their gas masks and thereby reduce their fighting efficiency while the 5th Division advanced unhampered by masks. The infantry in the assault force were equipped with white phosphorus hand and rifle grenades to clear German dugouts and machine gun positions. Infantry assigned to mop up isolated German strongpoints received tear gas grenades. Compared to the elaborate gas plans of the Allies, the 5th Division's preparations were very straight-forward, but considering the time allowed to prepare them they were certainly commendable.

The 5th Division was lucky in its choice of opponents. Lt. Gen. Fuchs, commanding German forces in the salient, anticipated the American attack and ordered two divisions to withdraw to intermediate positions. The commander of the 77th Reserve Division on the 5th Division's front, misinterpreted his orders, pulling back his guns but leaving most of his infantry in frontline positions. He could have corrected his error the next evening, but the American attack intervened. As the men of the 5th Division advanced, they saw blue flares rise from the German lines -- the signal for drumfire to repel the attack, but no German shells came. In the ensuing close combat the 77th Reserve Division ceased to exist as an organized unit. On the right, the U.S. 90th Division had more problems. The German 255th Division withdrew in good order behind a dense screen of mustard gas, and in the process slowed the advance of the right flank of the 5th Division. The initial attack and the following five days of pursuit cost the 5th Division 259 gas casualties, most probably attributable to the artillery of the 255th Division. In contrast, the 90th Division had 508 men gassed during the same period, the most gas casualties suffered by any American division at St. Mihiel.

The 5th Division left its positions in front of the German Hindenberg Line on 17 September and moved to the vicinity of Domevre-en-Haye for rehabilitation and training. Division headquarters gave special attention to the problems identified during the St. Mihiel operation: movement through woods, maintaining liaison between infantry and artillery, and use of gas masks. On 27 September, the division began moving north toward Verdun, where the First Army had opened the major American offensive of the war, the Meuse-Argonne Campaign, on 26 September.

The division joined the U.S. III Corps and moved into corps reserve in the Foret de Hesse on the night of 5-6 October.

The Meuse-Argonne Campaign consisted of an attack by three corps abreast up a defile north of Verdun, bordered by the Meuse River on the east and the Aire River on the west, leading to Sedan, a rail center and key to German lateral communications along the entire Western Front. High bluffs east of the Meuse and west of the Aire provided ideal artillery positions to bring the entire defile under a brutal crossfire. In the defile, the Argonne Forest presented an almost impenetrable barrier to the American left flank, and at the southern end stood commanding high ground at Montfaucon. Farther north, the heights around the village of Cunel dominated the defile. To the difficulties posed by geography the Germans added the experience gained from four years of war. They constructed four major defensive belts, the second of which was anchored on Montfaucon. The third and main position, the Hindenberg Line, rested on the heights around Cunel. The First Army planned to outflank Montfaucon on the first day of the offensive and capture the first two defense systems, advancing in all ten miles. It was then to concentrate against Cunel and launch a massive frontal assault and break through the Hindenberg Line on the second day. The timing was important. The Germans had only weak forces in the Meuse-Argonne Sector, but strong reserves could arrive within three days. Many of the U.S. divisions in the initial assault were untested in combat. When he saw the plan, Marshal Petain commented that the Americans would be hung up before Montfaucon all winter. But the result belied both American optimism and French pessimism. The attack captured Montfaucon, but only on the second day. Meanwhile a huge traffic jam behind U.S. lines delayed the movement of American reserves. The First Army seized outlying portions of the Hindenberg Line, but failed to break through, and German reserves arrived in time to stabilize the situation. Continuing American attacks, increasingly uncoordinated, produced high casualties without appreciable benefit, and Pershing finally decided to reorganize before launching another general assault. The movement of the 5th Division to the front was part of this reorganization. On the night of 11-12 October, it replaced the 3d Division opposite Cunel.

The First Army's gas program up to 14 October reflected the divided opinions and lack of experience with gas on the part of most senior American officers.

The French and British Armies used persistent gas in the offensive. They drenched suspected machine gun and artillery emplacements with mustard gas and then maneuvered around these locales in the attack. Gassed areas in World War I thus played much the same tactical role in the offensive as minefields did in World War II. But most American officers in September 1918 considered gas strictly a defensive weapon. Mustard gas was suitable for use against German positions east of the Meuse, but only because American troops did not plan to attack into the area. First Army otherwise planned to use nonpersistent toxic gas west of the Meuse and gave corps commanders discretion in using gas within their corps areas. Only the III Corps used phosgene. The I and V Corps relied on smoke and high explosives, their commanders fearing that the use of toxic gasses would produce German retaliation. The Germans suffered no such inhibitions and would use mustard gas freely.

When the American artillery displaced forward after the gains of the first two days, it carried only a minimal gas load. A logistics breakdown behind the American lines meant that sufficient quantities of gas shells could not reach the guns, and as a result of transportation problems, the 5th Division did not bring its organic artillery with it. Instead, the divisional artillery of the 80th Division and two regiments of the 3d Division's divisional artillery plus various French artillery battalions supported the 5th Division before Cunel.

General Pershing set 14 October as the date for the general attack. General McMahon, repeating orders from First Army, directed the artillery to "utilize to the fullest extent possible the advantages of lethal gas in preparing for and assisting the infantry attack and in causing casualties in the rear areas and along the lines of communication." He also attached the Stokes mortars to the two infantry brigades, enjoining them to "make maximum use" of the gas units. But the supply crisis restricted the amount and types of gas used to support the attack. First Army fired only small amounts of gas shells filled with tear gas and chlorpicrin, an asphyxiating gas considerably less lethal than phosgene, producing excessive tearing of the eyes before death -- and thus warning intended victims of its presence in ample time for them to don masks. Indeed the gas support on 14 October harassed rather than killed the enemy.

German artillery fire from across the Meuse, primarily high explosive fire rather than gas, proved particularly deadly for the 5th Division. A heavy con-

centration landed on the division as it assembled for the assault and caused many casualties, and as the infantry debouched from the trenches, another artillery concentration landed on them. The division pressed on. In some of the bitterest fighting of the war, it seized Cunel and the heights immediately in rear of the town, the Bois de la Pultiere, although fighting in the wood did not end until the next day. In sum, the division had broken into but not through the Hindenberg Line. General Pershing, dissatisfied with the progress, relieved General McMahon and replaced him with Maj. Gen. Hanson T. Ely. On 20 October, the division resumed the offensive, this time in a local action designed to clear the Bois des Rappes, a wood on the division's front approximately 1,000 yards long and 1,000 yards wide. General Ely made no particular provision for the use of gas during the attack. It took two days of hard fighting to capture the place. On the night of 22 October, the 90th Division relieved the 5th Division, which rested and refitted near Montfaucon for the next four days.

The 5th Division returned to the line on the night of 26-27 October and relieved the 3d Division, which held the front from the Bois de la Cote Lemont to a point 1½ kilometers south of the village of Aincreville. The 5th Division now occupied the extreme right of the III Corps and thus became the American division closest to the Meuse and the German guns on the other side. Maj. Gen. Hunter Liggett, who had succeeded Pershing in command of the First Army on 12 October, planned to open a new general assault on 1 November. This time, gas stocks were entirely adequate. Liggett ordered -- and enforced his orders -- that the corps commanders use liberal amounts of mustard gas. The use of mustard gas east of the Meuse, discontinued while the French XVII Corps made an unsucessful attempt to capture the heights, had resumed on 14 October. On 27 October, the artillery preparation began. It included tremendous amounts of gas shells. By 2 November, the 1st Austro Hungarian Division holding the Meuse line had suffered over 1,000 casualties to gas alone and had virtually ceased to exist.

In a local attack, the 5th Division captured Aincreville on 29 October. Two days later, it joined in the general assault. It captured Clery-le-Grand and Brieulles-sur-Meuse and reached the river at the latter point. To the west, the V Corps shattered the German line and made a deep penetration. In the exploitation that followed, Liggett ordered all three corps to pivot on the 5th Division and attack northeast toward the Meuse. By 3 November, the 5th Division closed to the river along almost its entire front. The maneuver was possible only

because First Army artillery used mustard gas to neutralize German artillery in the Bois de Sassey, which otherwise would have brought the 5th Division under fire from the flank as it pivoted. A patrol checking the wood a week later found lethal concentrations of gas there.

The Meuse constituted a particularly difficult barrier. The Americans had to attack over an open plain, cross an unfordable river, move over another plain, and finally cross a sixty-five-foot wide canal -- all under direct observation of the Germans on the heights. Lt. Col. Courtney H. Hodges, commanding the 2d Battalion, 6th Infantry, succeeded in crossing one company early on 3 November, but dawn brought discovery. German fire defeated attempts to cross the canal. Reinforced by a second company, the Americans finally succeeded in seizing a bridgehead east of the canal on the evening of 4 November, and small unit actions cleared the heights by the evening of 5 November. The division pursued the Germans for the next six days until halted by the Armistice.

Throughout the campaign the 5th Division suffered only 262 gas casualties, small losses compared to those endured by other American divisions. The 33d Division, for example, had 2,198 men gassed. The 5th Division, which ranked ninth among the twenty-five American divisions employed in the Meuse-Argonne in terms of total casualties, ranked nineteenth in terms of gas casualties. Despite confusion in the American high command about the appropriate way to wage gas warfare and the logistical snarl behind the American lines, the opponents of the 5th Division suffered far more heavily than it did. General Liggett may have sometimes lacked the materiel to always obey General McMahon's injunction about returning four gas shells for every one fired by the enemy, but Liggett agreed with the spirit of McMahon's position. The loss of the 1st Austro Hungarian Division to mustard gas certainly impaired the ability of the Germans to defend the line of the Meuse.

When the United States entered World War I, it found gas warfare part of the standard operating procedure of all the armies on the Western Front. Voluntary abnegation in the hope that the enemy would also refrain proved futile, as demonstrated by the experience of the U.S. I and V Corps in the opening stages of the Meuse-Argonne Campaign. On the battlefield, the need to maintain the morale of the assault infantry and the utility of gas in screening attacks, protecting flanks, and neutralizing enemy strongpoints provided much more convincing

guidelines for the use of gas than any concept of deterrence. In fact, the entire history of the use of gas during World War I demonstrated the consequences of an absence of deterrence. The Germans embarked on gas warfare because their chemical industry was so superior that they did not fear Allied retaliation. They consistently introduced ever more dangerous chemical weapons before the Allies Only in the last months of the war did the technical balance shift to the Allies -- too late for the new chemical munitions to reach the battlefield. The German collapse spared the combat troops of both sides the necessity of dealing with substances far more lethal than mustard gas.

Edgar F. Raines, Jr

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